SUPPORTING INFORMATION

Membrane protein channels equipped with a cleavable linker for inducing catalysis inside nanocompartments

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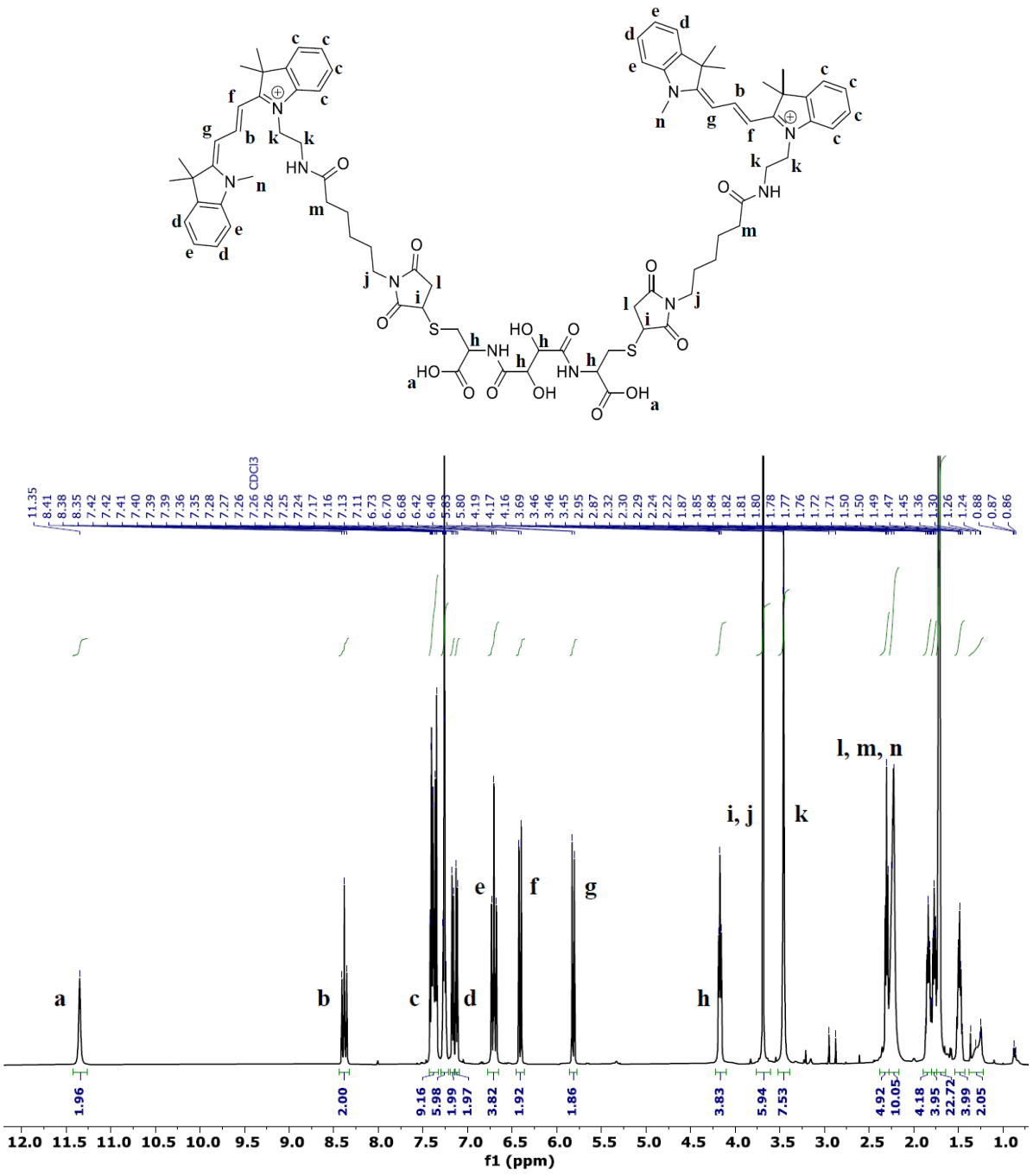

Figure S1. ^{1}H-NMR spectrum of Compound 2 in $CDCl_3$ at 500 MHz.

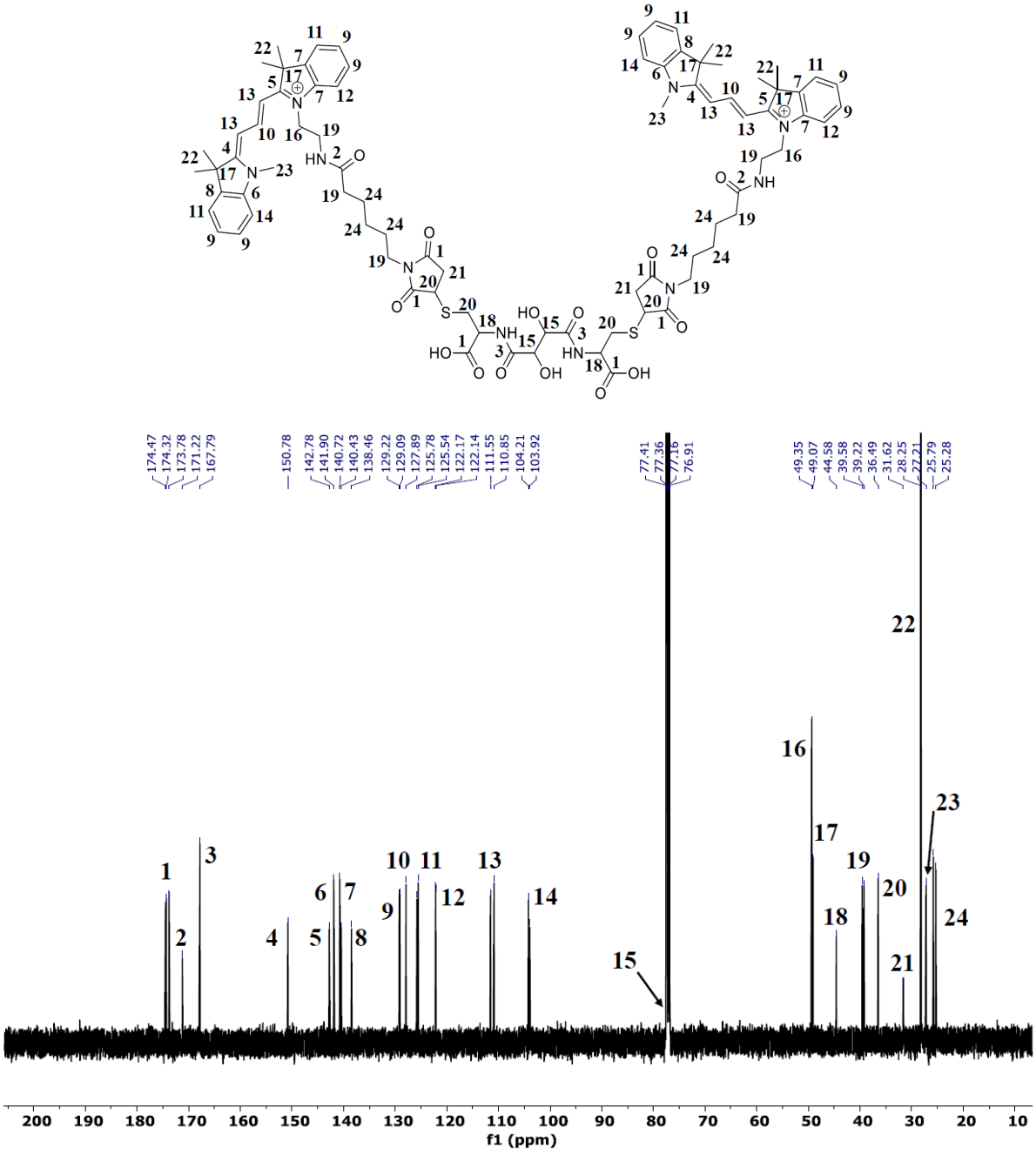

Figure S2. ^{13}C-NMR spectrum of Compound 2 in $CDCl_3$ at 126 MHz.

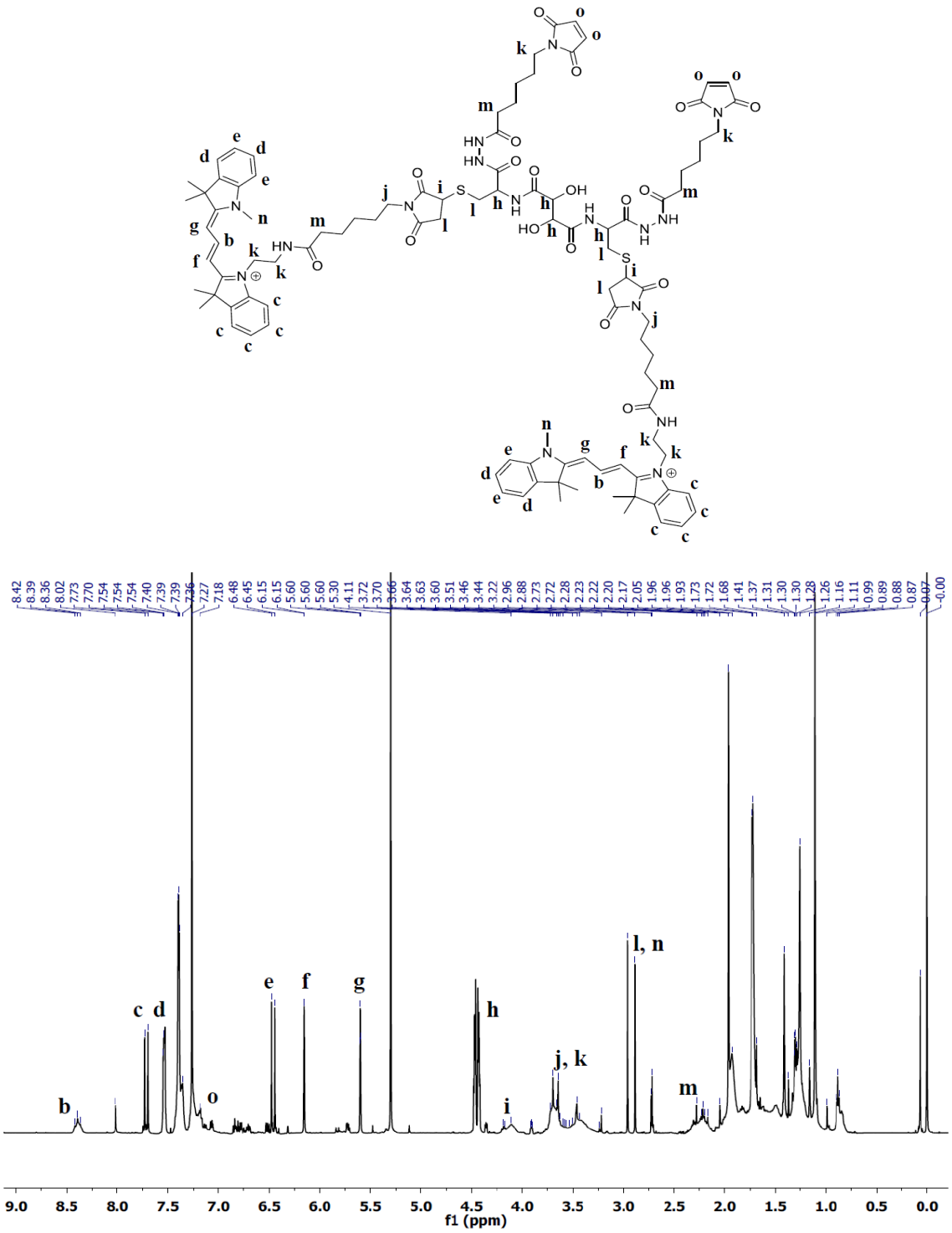

Figure S3. ^{1}H-NMR spectrum of the bismaleimide linker in $CDCl_3$ at 500 MHz.

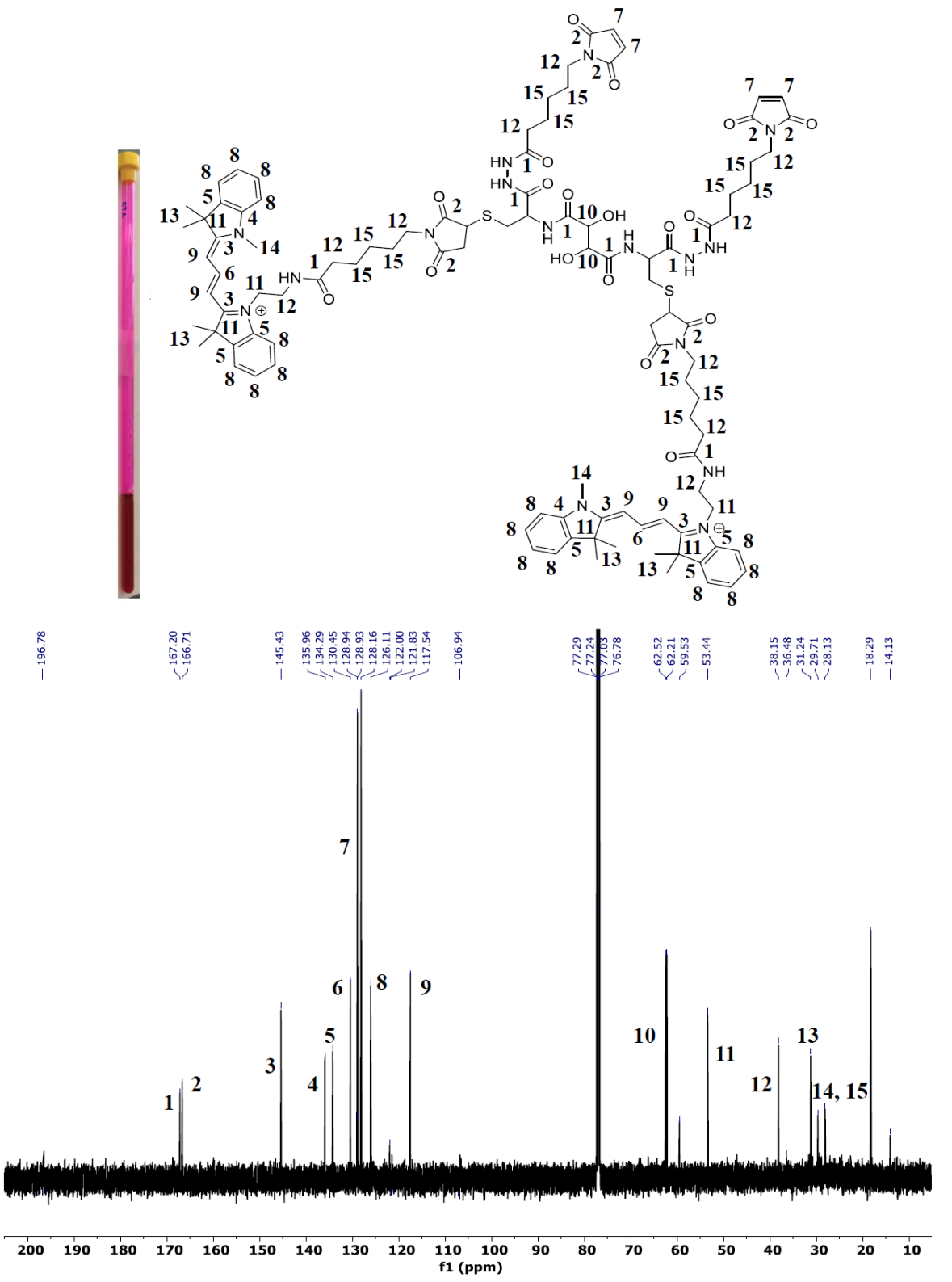

Figure S4. ^{13}C-NMR spectrum of the bismaleimide linker in $CDCl_3$ at 126 MHz and the image of the corresponding dissolved linker in the NMR tube.

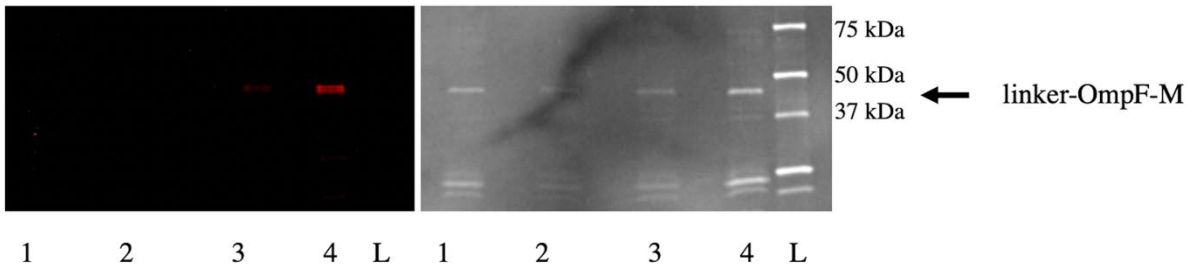

Figure S5. SDS PAGE of OmpF-M (*left,* fluorogram; *right,* Coomassie-stained): L: Protein ladder; 1, 2: unlabeled OmpF-M, at 1/1 (1) and 2/1 (2) ratio (v/v) with loading buffer; 3, 4: OmpF-M labelled with the linker comprising fluorescent cyanine3 (λ_{ex} = 550 nm / λ_{em} = 580 nm). M_W of OmpF around 40 kDa.

Table S1. Fluorescence correlation parameters of the free fluorophore cyanine3 maleimide, free linker, CNCs with OmpF-M-linker inserted in the membrane, stand-alone OmpF-M-linker, and OmpF-M-linker added to empty polymersomes before and after staining the polymersomes with BODIPY 630/650-X.

	Counts per molecule (kHz)	Diffusion time (µs)
Cyanine3 maleimide	1.7	61
Linker	2.3	70
OmpF-M-Linker CNCs	28.3	4530
Linker-OmpF-M	3.1	452
CNCs AND linker- OmpF-M without BODIPY	7.0	452
CNCs AND linker-OmpF-M with BODIPY	138.3	6000

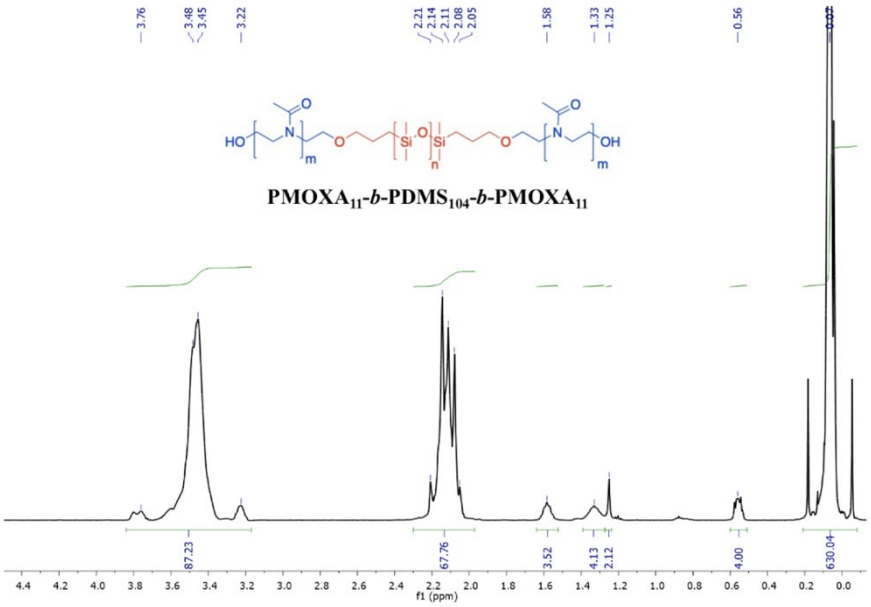

Figure S6. ^{1}H-NMR spectrum of poly(2-methyl-2-oxazoline)-*b*-poly(dimethylsiloxane)-*b*-poly(2-methyl-2-oxazoline) triblock copolymer ($PMOXA_{11}$-*b*-$PDMS_{104}$-*b*-$PMOXA_{11}$) in $CDCl_3$ at 500 MHz.

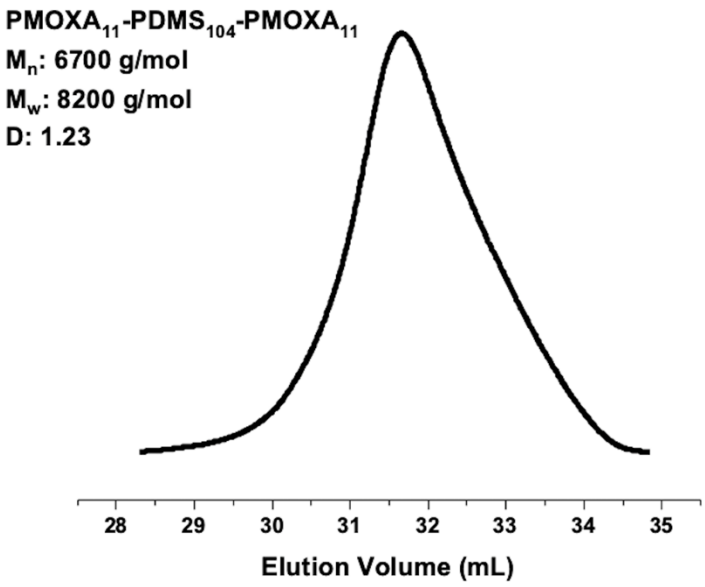

Figure S7. Elugram (GPC) of $PMOXA_{11}$-*b*-$PDMS_{104}$-*b*-$PMOXA_{11}$ in DMF.

Table S2. Data from NTA measurements of CNC-noOmpF, CNC-linker-OmpF-M, CNC-OmpF-M), and CNC-OmpF-WT samples diluted 1:1000 in PBS.

	CNC-noOmpF	CNC-linker-OmpF-M	CNC-OmpF-M	CNC-OmpF-WT
diameter (nm)	202 ± 47	192 ± 42	182 ± 42	215 ± 49
concentration (particles/mL)	$2.6 \times 10^8 \pm 1.6 \times 10^7$	$1.8 \times 10^8 \pm 4.5 \times 10^6$	$3.1 \times 10^8 \pm 1.7 \times 10^7$	$3.8 \times 10^8 \pm 2.4 \times 10^7$

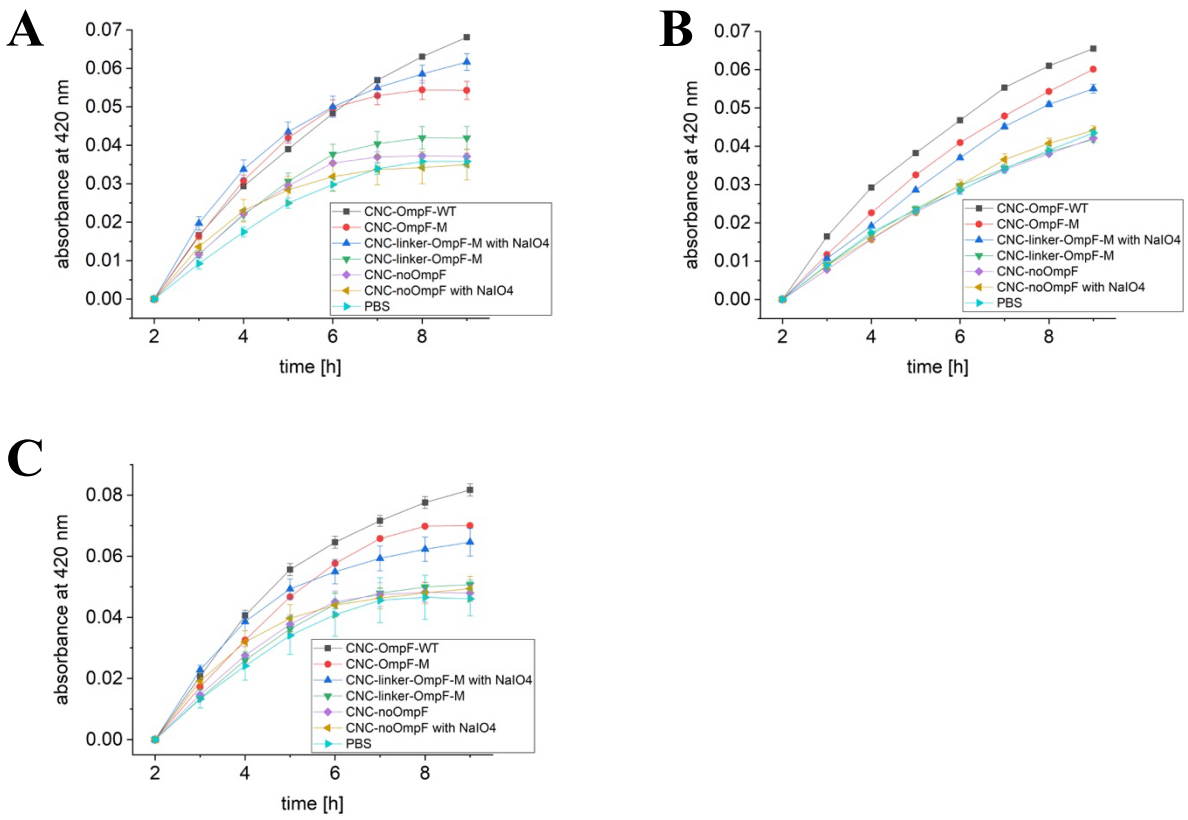

Figure S8. Laccase activity of CNCs in response to $NaIO_4$. Measurements were carried out in triplicate at pH 7.4, over 9 h at RT: ABTS in PBS with CNC-OmpF-WT (black), ABTS in PBS with CNC-OmpF-M (red), ABTS in PBS with CNC-linker-OmpF-M in the presence (green) and absence of $NaIO_4$ (blue), CNC-noOmpF without (purple) and with $NaIO_4$ (yellow), and ATBS in PBS (turquoise). (A-C) represent 3 independent CNC preparations (each with standard deviation).

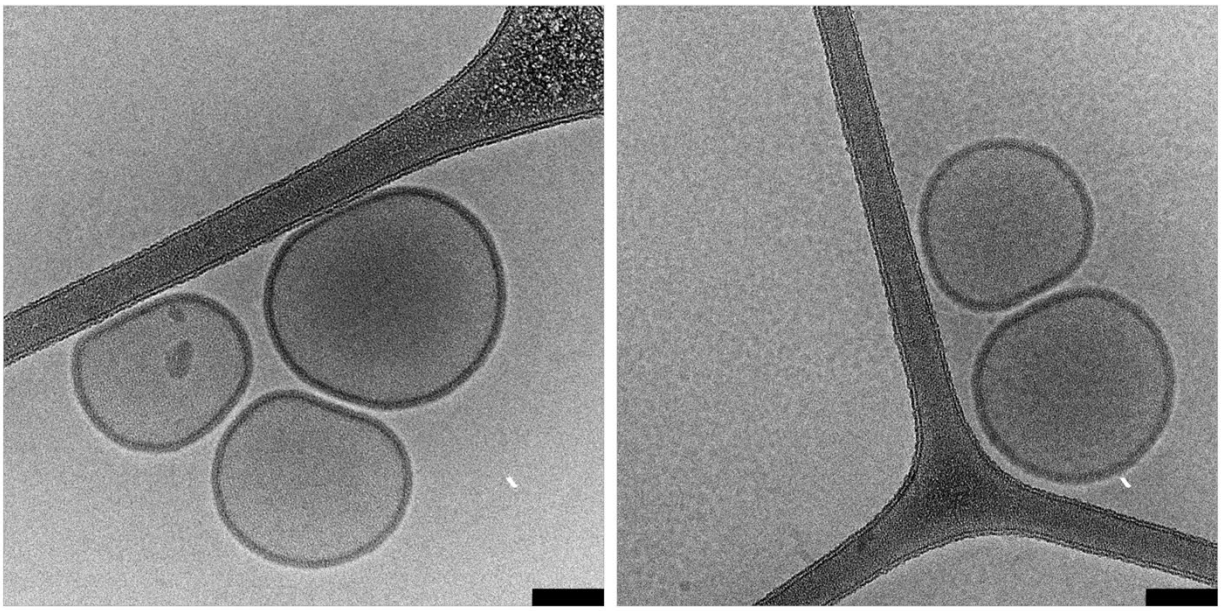

Figure S9. Cryo-TEM micrographs of polymersomes self-assembled from PMOXA$_{11}$-*b*-PDMS$_{104}$-*b*-PMOXA$_{11}$. Scale bars: 100 nm

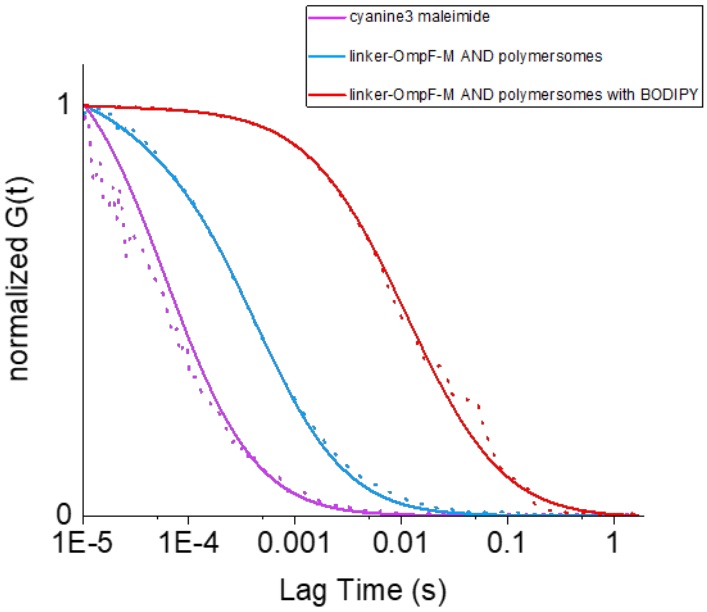

Figure S10. FCS autocorrelation curves (solid line) and raw data (dots) of PBS solutions of cyanine3 maleimide (pink), OmpF-M-linker in 1% OG added to empty polymersomes without BODIPY 630/650-X (blue) and stained with BODIPY 630/650-X (red).

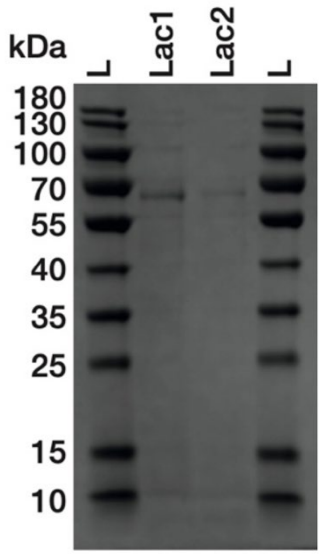

Figure S11. SDS PAGE of fungal laccase from *Agaricus bisporus*: L: Protein ladder; Lac1: 10 µg laccase; Lac2: 5 µg laccase.

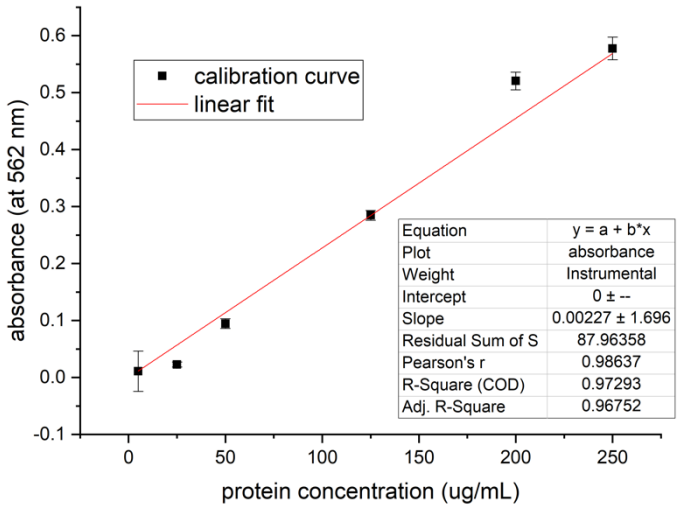

Figure S12. Calibration curve for BCA assay performed according to the supplier's protocol (Thermo Fisher Scientific, U.S.A.)